



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/021,000	12/19/2001	Nobuo Takeshita	2257-0202P-SP	8807
2292 7590 05/18/2007 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747			EXAMINER CHU, KIM KWOK	
			ART UNIT 2627	PAPER NUMBER
			NOTIFICATION DATE 05/18/2007	DELIVERY MODE ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary

Application No.

10/021,000

Applicant(s)

TAKESHITA, NOBUO

Examiner

Kim-Kwok CHU

Art Unit

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 February 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and, 6-11 is/are rejected.
- 7) ☒ Claim(s) 2-5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 January 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Response to Remarks

1. Applicant's Remarks filed on February 20, 2007 has been fully considered. Claims 1-11 are pending and Claims 1-11 have been allowed. However, a further interpretation of Claims 1 and 6-11 requires a new rejection action with the previous cited prior art. In Claim 1, the amended feature "the bearing hole having a diameter that gradually increases while approaching the bearing hole's openings from the bearing hole's center" is disclosed in the prior art of Kanada (U.S. Patent 6,757,236) and Wakabayashi et al. (U.S. Patent 5,905,255). For example, Kanada and Wakabayashi both teach a bearing hole 29 and 5 respectively as illustrated in Fig. 5. Although each prior art's bearing hole has a same diameter, however, each bearing hole, for example, Wakabayashi's hole 5 has an increase radius when measured from the center of the hole to the surface of the hole gradually upward. In other words, Applicant does not claim a cone shaped bearing hole (the direction of diameter increase) but only defines the direction and measurement of the bearing hole is formed. Hence, both the prior art of Kanada and Wakabayashi teach "the bearing hole having a diameter that gradually increases (measured upward along the hole's wall) while approaching the bearing hole's openings from the bearing hole's center".

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Kanada (U.S. Patent 6,757,236) in view of Wakabayashi et al. (U.S. Patent 5,905,255).

Kanada teaches an optical head structure very similar to that of the instant invention. For example, Kanada teaches the following elements and means:

(a) as in claim 1, an objective lens 30 for bringing light emitted from a light source into focus on an information recording medium 7 (Figs. 1 and 3); a lens holder 28 for holding the objective lens 30 (Fig. 1); the lens holder 28 having a bearing hole 29 formed along a direction parallel to an optical axis of the objective lens 30 (Fig. 1); the bearing hole having a diameter that gradually increase while approaching the bearing hole's openings from the bearing hole

center (Fig. 1; and a support shaft 29 inserted in the bearing hole 29 (Fig. 1; column 4, lines 60 and 61).

However, Kanada does not teach the following:

- (i) as in claim 1, an inclination drive unit;
- (ii) as in claim 1, a light detector for receiving the light reflected from the information recording medium and outputting information about inclination of the objective lens relative to the information recording medium on the basis of the light received; and

- (iii) as in claim 1, an inclination drive unit for, according to the information about the inclination, turning the lens holder on a first axis perpendicular to the support shaft.

Wakabayashi teaches an optical head tilt detection device having the following:

- (i) an inclination drive unit 7a, 7b (Fig. 2; tilt control is the inclination drive unit);
- (ii) a light detector 4 for receiving the light reflected from the information recording medium and outputting information about inclination of the objective lens relative to the information recording medium on the basis of the light received (Fig. 2); and
- (iii) an inclination drive unit for, according to the information about the inclination, turning the lens holder perpendicular to a first axis (Fig. 8; column 10, lines 39-48).

A biaxial actuator such as Kanada's requires its optical head maintaining a perpendicular direction to the disk. Hence, to compensate for any radial shift of an objective lens relative to the disk, it would have been obvious to one of ordinary skill in the art to replace Kanada's lens servo drive unit with Wakabayashi's tilt control servo means, because Wakabayashi's tilt sensing means can detect the tilting of the recording medium and then the tilt correction means can maintain the proper focusing of the emitted light beam.

4. Claims 6-11 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Kanada (U.S. Patent 6,757,236) in view of Wakabayashi et al. (U.S. Patent 5,905,255) and Nii et al. (U.S. Patent 6,574,186).

Kanada in view of Wakabayashi teach an optical head tilting adjustment structure very similar to that of the instant invention as in Claims 6-8. However, both Kanada and Wakabayashi do not teach the following:

(i) as in claim 6, a fluid provided in the bearing hole;

(ii) as in claim 7, the fluid includes a magnetic fluid;

and

(iii) as in claim 8, lens holder further includes a permanent magnet located opposite the bearing hole and the magnetic fluid.

Nii teaches a bearing having the following:

- (i) a fluid provided 5 in the bearing hole 1 (Fig. 1);
- (ii) the fluid 5 includes a magnetic fluid (Fig. 1; column 2m line 30); and
- (iii) a permanent magnet 4 located opposite the bearing hole and the magnetic fluid 5 (Fig. 1).

To perform high speed and accurate rotation, it would have been obvious to one of ordinary skill in the art to use a magnetic fluid bearing such as Nii's as Kanada's lens holder, because the magnetic fluid acts as a lubricant in the bearing and can suppress axial shake and improve rotation accuracy of the lens holder.

5. Claims 9-11 have limitations similar to those treated in the above rejection, and are met by the references as discussed above. In addition, claim 11 recites the following feature which is also disclosed by the prior art of Wakabayashi:

- (a) as in claim 11, the lens holder further includes a permanent magnet 3a-3d (Fig. 9(a)).

Allowable Subject Matter

6. Claims 2-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

As in claim 2, the prior art of record fails to teach or fairly suggest that the bearing hole has a hole diameter that increases as it approaches openings of the bearing hole from the center of the bearing hole, and the bearing hole has a wall that is generally circularly arcuate in cross-sectional shape.

As in claim 5, the prior art of record fails to teach or fairly suggest the following features:

(a) the inclination drive unit includes electromagnetic drive means comprising a first element mounted on the lens holder on a second axis perpendicular to both the support shaft and the first axis perpendicular to the support shaft, and a second element located opposite the first element; and

(b) the inclination drive unit includes electromagnetic drive means comprising a magnetic material fixedly mounted on the lens holder in close vicinity to the second element of the electromagnetic drive means.

The features indicated above, in combination with the other elements of the claims, are not anticipated by, nor made obvious over, the prior art of record.

Related Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nagashima (6,222,687) is pertinent because Nagashima teaches a bearing unit having a curve supporting surface.

9. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kim CHU whose telephone number is (571) 272-7585 between 9:30 am to 6:00 pm, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrea Wellington, can be reached on (571) 272-4483.

The fax number for the organization where this application or proceeding is assigned is (571) 273-8300


Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished application is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9191 (toll free).

Kim-Kwok CHU

Examiner AU2627

May 13, 2007

(571) 272-7585


ANDREA WELLINGTON
SUPERVISORY PATENT EXAMINER